REMARKS

This application has been reviewed in light of the Office Action dated January 29, 2004. Claims 1-5, 7, 8, and 10-24 are presented for examination, of which Claims 1, 10, 15, and 20, the independent claims, have been amended to define still more clearly what Applicants regard as their invention. Claims 4, 13, 17, and 23 have been amended as to a matter of form. Claim 8 has been canceled without prejudice or disclaimer of subject matter. Favorable reconsideration is requested.

Applicant notes with appreciation the continued indication that Claims 3, 4, 12, 13, 17, 18, 22, and 23 would be allowable if rewritten so as not to depend from a rejected claim, and with no change in scope. These claims have not been so rewritten because, for the reasons given below, their base claims are believed to be allowable.

Claim 8 was objected to because of an informality noted in paragraph 2 of the Office Action, on page 2.

Cancellation of Claim 8 renders the objection to that claim moot.

Of the remaining Claims, Claims 1, 2, 5, 7, 10, 11, 14-16, 19-21 and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,008,752 (*Van Nostrand*) in view of US Patent No. 5,054,100 (*Tai*).

As shown above, Applicants have amended independent Claims 1, 10, 15, and 20 in terms that still more clearly define what they regard as their invention. Applicants submit that these amended independent claims, together with the remaining claims dependent thereon, are patentably distinct from the cited prior art for at least the following reasons.

The aspect of the present invention set forth in Claim 1 is a method of interpolating a first set of discrete sample values to generate a second set of discrete sample

values using one of a plurality of interpolation kernels. The interpolation kernel is selected depending on an edge strength indicator, an edge direction indicator and a local contrast indicator for each of the discrete sample values of the first set. The local contrast indicator is used to indicate text regions represented by the first set of discrete sample values in order to optimize the selection of the interpolation kernel, and the selection of the interpolation kernel is performed using a kernel selection map processed in accordance with a cleansing process such that the kernel selected for a particular discrete sample value of the first set is dependent on the kernel selected for a further discrete sample value adjacent to the particular discrete sample value.

Among other important features of Claim 1 is that the selection of the interpolation kernel is performed using a kernel selection map processed in accordance with a cleansing process such that the kernel selected for a particular discrete sample value of the first set is dependent on the kernel selected for a further discrete sample value adjacent to the particular discrete sample value.

As disclosed at page 13, lines 23-27, of the present specification in relation to the cleaning of the kernel selection map process, there are cases of isolated edge directions occurring in an otherwise uniformly directed local region. These sparsely distributed edge regions are best re-oriented to the underlying uniformly directed edge region or smooth background. This is to avoid excessive kernel switching which may result in visual artifacts in the interpolated image. Further, as described at page 14, lines 3-6, of the present specification, at step 520 of the cleaning of the kernel selection map process, the major and minor edge orientations are identified and minor edge pixels are reassigned to the major orientation in the following steps, with the exception of identified text region pixels. Accordingly, the kernel

selection at a particular pixel or discrete sample value is dependent on the kernel selected at an adjacent pixel.

Van Nostrand describes an interpolator for enlarging or reducing a digital image. An interpolation coefficient memory contains interpolation coefficients representing several different one-dimensional interpolation kernels. A row interpolator receives image pixel values, retrieves interpolation coefficients from the memory and produces interpolated pixel values by interpolating in a row direction. A column interpolator receives multiple rows of interpolated pixel values from the row interpolator, retrieves interpolation coefficients from the memory, and produces rows of interpolated pixel values by interpolating in a column direction. A logic and control unit monitors the contents of the input data and switches between interpolation kernels to provide optimum interpolation for each type of content (see Abstract).

The preferred embodiment of *Van Nostrand* employs two interpolation kernels. A cubic convolution kernel is used for continuous tone images and a replication kernel is used for alphanumeric text (see col. 5, lines 46-57).

The Office Action concedes that *Van Nostrand* does not specify using an edge strength indicator and an edge direction indicator. Furthermore, nothing has been found in *Van Nostrand* that would teach or suggest selecting an interpolation kernel using a kernel selection map processed in accordance with a cleaning process such that the kernel selected for a particular discrete sample value of the first set is dependent on the kernel selected for a further discrete sample value adjacent to the particular discrete sample value.

Applicants submit that *Tai* does not overcome the deficiencies of *Van Nostrand*.

Tai relates to a pixel interpolator with edge sharpening. A quadratic interpolation equation is used-to-apply location weighting factors to the density values of neighboring pixels. Edge strength modifying factors are used to modify the weighting factors in the X, Y and diagonal directions. In one embodiment, the modifying factors are set to greater than unity when the corresponding edge strength is greater than a predetermined threshold value. In another embodiment, the modifying factors are a non-linear function of the edge -strength (see Abstract). *Tai* describes the modification of a single interpolation equation. Nothing has been found in *Tai* that would teach or suggest selecting interpolation kernels from a plurality of interpolation kernels, as recited in Claim 1. Further nothing has been found in *Tai* that would teach or suggest selecting the interpolation kernel using a kernel selection map processed in accordance with a cleaning process such that the kernel selected for a particular discrete sample value of the first set is dependent on the kernel selected for a further discrete sample value adjacent to the particular discrete sample value, as further recited in Claim 1.

Applicant submits that neither *Van Nostrand* nor *Tai*, nor any combination thereof (assuming *arguendo* that any such combination would be permissible) teaches or suggests the method of Claim 1, of selecting the interpolation kernel using a kernel selection map processed in accordance with a cleaning process such that the kernel selected for a particular discrete sample value of a first set of discrete sample values is dependent on the kernel selected for a further discrete sample value adjacent to the particular discrete sample value.

For at least these reasons, Applicants believe that Claim 1 is clearly patentable over the cited prior art.

Independent Claims 15 and 20 are apparatus, and computer readable medium claims, respectively, corresponding to method Claim 1, and Claim 10 is to a method similar to

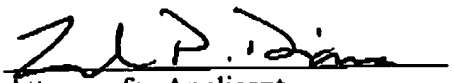
that of Claim 1; these three claims are believed to be patentable for at least the same reasons as those discussed above in connection with claim 1.

The other claims in this application are each dependent from one or another of the independent claims discussed above and are therefore believed patentable for the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, Applicant respectfully requests favorable reconsideration and early passage to issue of the present application.

Applicant's undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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